

Patent claims

1. A method for producing flavor-active terpenes from terpene hydrocarbons by means of a selective biotransformation and using microorganisms of the ascomycetes, basidiomycetes and deuteromycetes classes, wherein a lyophilized mycel is used which is firstly rehydrated and then mixed with the substrate.
2. The method as claimed in Claim 1, wherein the mycel cells are additionally permeated by ultrasonic treatment and/or extrusion.
3. The method as claimed in either Claim 1 or Claim 2, wherein the biotransformation is carried out in a submerged culture.
4. The method as claimed in any one of Claims 1 to 3, wherein the biotransformation is carried out in an enantioselective, a stereoselective and/or a regioselective manner.
5. The method as claimed in any one of Claims 1 to 4, wherein representatives of *Fusarium*, *Pleurotus*, *Penicillium* and *Chaetomium*, and in particular *Fusarium proliferatus*, *Pleurotus sapidus*, *Penicillium citrinum* and *Chaetomium globosum* are used as the biocatalysts.
6. The method as claimed in any one of Claims 1 to 5, wherein mono- and sesquiterpenes and particularly preferably limonene, in particular R-(+)-limonene or S-(-)-limonene, and pinene, valencene, farnesene, thymol and dimethyl allyl alcohol are used as the terpene hydrocarbons.
7. The method as claimed in any one of Claims 1 to 6, wherein before the biotransformation an enzyme induction is carried out in the lyophilized mycel by addition of substrate.
8. The method as claimed in any one of Claims 1 to 7, wherein the biotransformation is carried out in a two-phase system and preferably without co-solvents.

9. The method as claimed in any one of Claims 1 to 8, wherein the biotransformation is carried out in a medium with a reduced quantity M of carbon source, wherein M is preferably $< 50 \text{ gL}^{-1}$.

10. The method as claimed in any one of Claims 1 to 9, wherein the reaction is carried out in a stirred tank, surface or fixed bed reactor.

11. The method as claimed in any one of Claims 1 to 10, wherein terpenoid alcohols, epoxides, aldehydes, ketones, multiple alcohols, carbonyls and carbonyl alcohols and in particular piperitone, isopiperitone, isopiperitenol, isopiperitenone, perillaaldehyde, carvone, carveol, linalool, linalool oxide, terpineol and nootkatol and nootkatone are obtained as the flavor-active terpenes.

12. The method as claimed in any one of Claims 1 to 11, wherein the transformation products are isolated from cellular compartments or fractions.

13. The method as claimed in any one of Claims 1 to 12, wherein firstly, particularly preferably with *Fusarium spec.* as the biocatalyst, R-(+)-limonene is biotransformed in an enantioselective manner to cis-(+)-carveol and S-(-)-limonene is biotransformed in an enantioselective manner to trans-(-)-carveol and subsequently trans-(-)-carveol, particularly preferably with *Pleurotus spec.* as the biocatalyst, to R-(-)-carvone.

14. The method as claimed in any one of Claims 1 to 11, wherein bicyclic sesquiterpenes are transformed, particularly preferably with *Chaetomium spec.*, to β -nootkatol and subsequently to nootkatone.

15. The use of the terpenes produced using the method as claimed in any one of Claims 1 to 14 as odorants, flavors and flavorings, preferably in the food, cosmetics and pharmaceutical industries.